

1. A composite chemical barrier fabric having improved durability comprising:

a chemical barrier, multiple layer compositions coated on at least one side with a film of thermoplastic polyolefin with a molecular weight distribution range of from about 0.85 to about 0.95, the coated chemical barrier composite achieving at least about 25% improvement in puncture resistance and at least about 25% improvement in flex-crack resistance of the fabric.

2. The composite chemical barrier fabric of Claim 1 wherein the chemical barrier, multiple layer compositions contains at least one stratum selected from the group consisting of polyvinylidene chloride, ethylene vinyl acetate, ethylene vinyl alcohol, nylon, polyvinyl alcohol, polyester, polytetrafluoroethylene, fluorinated ethylene propylene, polyvinylidene chloride copolymer, acrylic, acrylonitrile copolymer, ionomers, Surllyn, polybutylene, metalized polyester, polypropylene, oriented polypropylene, polyamide, and the like.

3. The composite chemical barrier fabric according to Claim 2 wherein the multi-layer compositions have one or more exposed surfaces selected from the group consisting of polyethylene, ethylene ethyl acrylate, ethylene methyl acrylate, ethylene vinyl acetate, ethylene vinyl acetate copolymer, or polypropylene.

4. The composite chemical barrier fabric of Claim 3 wherein the thermoplastic polyolefin coating has a thickness greater than 1 mil.

5. The composite chemical barrier fabric of Claim 4 wherein the thermoplastic polyolefin coating has a more specific thickness of at least about 1 mils to about 10 mils.

6. The composite chemical barrier fabric of Claim 3 wherein the thermoplastic polyolefin is in the form of a free film and is laminated to one or more of the exposed surfaces

of the chemical barrier, multiple film composition.

7. The composite chemical barrier fabric of Claim 1 wherein the fabric is configured into items of protective clothing including suits, gloves, hoods and shoe covers. <sup>gas-tight zippers,</sup>

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8. The composite chemical barrier fabric of Claim 1 wherein the seams are sealed using hot air welding.

9. The composite chemical barrier fabric of Claim 1 wherein the fabric is slit to a narrow width for use as a seam sealing tape.

10. The composite chemical barrier fabric of Claim 1 wherein the fabric is slit to a narrow width and used as an interfacing material in combination with PVC and PVC/CPE alloy fabrics to create gas-tight unions between PVC visors and PVC zippers.

11. The composite chemical barrier fabric of Claim 1 wherein the fabric is a coextruded multi-layered chemical barrier with one or more exterior layers of thermoplastic polyolefin.

12. The composite chemical barrier fabric of Claim 1 wherein the thermoplastic polyolefin film is comprised of polypropylene.

13. A composite chemical barrier fabric having improved durability, comprising:  
a chemical barrier, multiple film composition created on at least one side with a layer of a thermoplastic olefin resin, the resin having an ASTM D1238 melt flow rate 230/2.16 g/10min of about 0.45; an ASTM D793 density at 23 degrees celsius. g/cm<sup>3</sup> of about 0.88; and an ASTM D1693 environmental stress-cracking resistance, hours of about > 3,000.

14. The composite chemical barrier fabric according to Claim 13 wherein the resin

is comprised substantially of polypropylene.

15. The composite chemical barrier fabric according to Claim 13 wherein the resin is comprised of polypropylene, polyethylene copolymers.

16. The composite chemical barrier fabric according to Claim 13 wherein the resin is comprised of blends of polypropylene and polyethylene.

17. The composite chemical barrier fabric according to Claim 13 wherein the resin is comprised of a majority of polypropylene mixed with other thermoplastic olefin resins.

18. The composite chemical barrier fabric of Claim 13 wherein the chemical barrier, multiple film composition containing at least one stratum selected from the group consisting essentially of polyvinylidene chloride, ethylene vinyl acetate, ethylene vinyl alcohol, nylon, polyvinyl alcohol, polyester, polytetrafluoroethylene, fluorinated ethylene propylene, polyvinylidene chloride copolymer, acrylic, acrylonitrile copolymer, ionomers, Surlyn, polybutylene, metalized polyester, polypropylene, oriented polypropylene, polyamide, and the like.

19. The composite chemical barrier fabric according to Claim 18 wherein the multi-layer film has one or more exposed surfaces selected from the group consisting essentially of polyethylene, ethylene ethyl acrylate, ethylene methyl acrylate, ethylene vinyl acetate, ethylene vinyl acetate copolymer, or polypropylene.

20. The composite chemical barrier fabric of Claim 19 wherein the thermoplastic olefin coating has a thickness greater than 1 mil.

21. The composite chemical barrier fabric of Claim 19 wherein the thermoplastic

olefin coating has a thickness of between 1 mils and 10 mils.

22. The composite chemical barrier fabric of Claim 13 wherein the thermoplastic olefin is in the form of a free film and subsequently laminated to one or more of the exposed surfaces of the chemical barrier, multiple film composition.

23. The composite chemical barrier fabric of Claim 13 wherein the flex crack resistance of the fabric is enhanced by at least 25% through the combination of a multi-layered chemical barrier film and the added layer of thermoplastic olefin resin.

24. The composite chemical barrier fabric of Claim 13 wherein the puncture resistance of the fabric is enhanced by at least 25% through the combination of a multi-layered chemical barrier film and the added layer of thermoplastic olefin resin.

25. The composite chemical barrier fabric of Claim 13 wherein the fabric is sealable using hot air welding.

